Hercules Synthetic Minor Permit Public Hearing

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December 8, 2016

Blue Skies Delaware; Clean Air for Life

Agenda

- Opening Remarks - Presiding Hearing Officer
  - Robert P. Haynes, Esq. Office of the Secretary
- DAQ's Presentation
  - Angela Marconi, P.E., BCEE
- Applicant's Presentation
  - Tom Baker, Hercules
  - Richmond Williams, Hercules
- Public Speakers-pre-registered first then from sign-in sheet.

Overview

- Division of Air Quality
  - Public Hearing Process
  - DAQ Permit Process
  - Project Scope
  - Permit Conditions
- Applicant
  - Presentation of application/project

After the Public Hearing

- Public comment period closed by Hearing Officer
- DAQ and Applicant respond to comments and questions raised
- Hearing Officer prepares report for the Secretary
- Secretary makes decision and Secretary's Order makes it official

DAQ Air Permit Process

- Facility Background
  - First permit issued 1979
  - Title V Facility since 1999

- Request to downsize to Synthetic Minor in 2012

DAQ Air Permit Process

- Summary of events
  - Application for four spray dryers received in 2013
  - Construction permit advertised and issued in 2014
  - Operating permit for one Dryer issued October 2015
  - **Facility and Department begin permit transition from Title V to Synthetic Minor December 2015**
  - Application resubmitted May 2016 as one SM permit with more accurate potential to emit (PTE) limits.
  - Synthetic Minor permit advertised Sept 2016

DAQ Air Permit Process

- Sept 2016 public meeting comments
  - Zoning Concerns
  - Emissions Concerns
  - Monitoring/Testing Requirements

Project Scope

- Facility houses corporate administrative buildings and Research and Development labs.
- The facility property is zoned Office Regional
  - Allows Light Industry including R&D facilities “where the facility generally resembles an industrial or manufacturing facility”

Project Scope

- Spray Dryers
  - Four units
  - Used for R&D for the pharmaceutical industry
  - The process recovers pharmaceutical powder that is suspended in solvent
- Emissions are from solvents used in the spray drying process

Project Scope

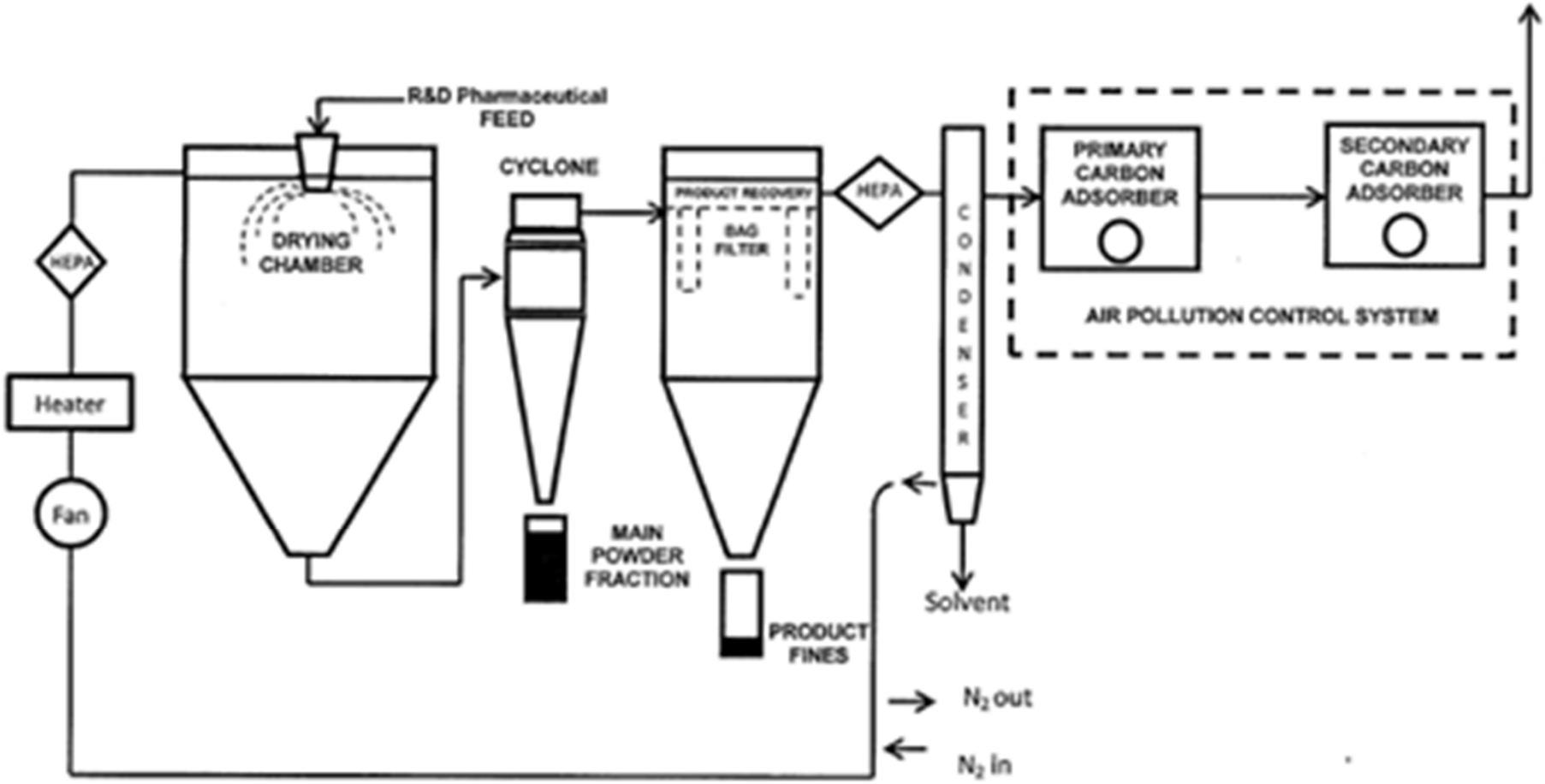
Units

- Four spray dryers
  - PSD-1 GMP Spray Dryer
  - PSD-1 R&D Spray Dryer
  - SD Micro Spray Dryer
  - MP-1 Fluid Bed
- Carbon Adsorption System

Pollution Control

- All four spray dryers vent to the carbon adsorbers.
- The two PSD-1 spray dryers have condensers that collect most of the solvent in liquid form.

Project Scope



DAQ Permitting

- Permits Conditions
  - Emission limits protective of human health and the environment
  - Minimal visible emissions
  - Maintain records for a minimum of 5 years
    - Operating data
    - Carbon Bed Usage Log
    - Emissions Tracking
    - Material Safety Data Sheets
    - Relevant employee training
    - Maintenance
  - Report deviations from permitted conditions

DAQ Permitting

- How will emissions be tracked?
  - Material Balance
    - The emissions are directly proportional to the quantity of solvent used.
    - Carbon beds changed at 85% capacity, based on usage.
  - Weekly checks of control equipment
    - Leak check using soapy water solution
    - Breakthrough test using Dragger tube (or equivalent)

Emissions Summary

- Seven solvents are permitted for use in the spray dryers

Solvent	Pollutant
Ethanol	VOC
Isopropyl Alcohol	VOC
Ethyl Acetate	VOC
Tetrahydrofuran	VOC
Methanol	VOC/HAP
Methylene Chloride	HAP
Acetone	-

Emissions Summary

- The permit limits are conservative values with several worst case assumptions
  - All four spray dryers are operating simultaneously
  - Operating each unit at the maximum capacity
  - All batches are of the most volatile solvent

	Pollutant	Annual PTE (tons/yr)
Scenario 1	Acetone	2.9
Scenario 2	VOC	2.5
Scenario 3	HAP	3.1

Emissions Modeling

- *2014 Threshold limit values (TLVs) and BEIs,* published by the American Conference of Governmental Industrial Hygienists (ACGIH).
- EPA's Screen 3 Model
- The Department requires the ratio of the Threshold Limit Value to the Maximum Downwind Concentration (TLV: MDC) is *at least* 100:1 at the nearest property boundary line and beyond for each air contaminant released.

Solvent	Pollutant	TLV : MDC
Ethanol	VOC	20929
Isopropyl Alcohol	VOC	6519
Ethyl Acetate	VOC	4204
Tetrahydrofuran	VOC	277
Methanol	VOC/HAP	1715
Methylene Chloride	HAP	129
Acetone	-	1796

Condensers

- PSD spray dryers are equipped with solvent condensers.

Solvent	Maximum Condenser Temperature (°C)
Ethanol	5
Isopropyl Alcohol	5
Ethyl Acetate	5
Tetrahydrofuran	5
Methanol	5
Methylene Chloride	-10
Acetone	5

Operating Limitations

- Only one spray dryer may operate using Methylene chloride at any time
- Spray dryers are not permitted to operate without condensers (if applicable) and carbon beds operating properly
- All structural and mechanical components of process must be maintained in proper operating condition.

Thank You